

DETAILED ACTION

1. Claims 20, 22, 45-46 and 49-52 are pending in this Office Action.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 9/24/2009 was filed and considered by the examiner.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. William Paradice on 10/19/2009.

4. The application has been amended as follows in view of expediting allowances:

IN THE CLAIMS:

- A. Cancel claim 21.
 - B. Rewrite claims 20 and 45 as follows;
20. (Currently Amended) A method, comprising:

receiving a text string having a plurality of characters; and

performing an unanchored search of a database of a stored patterns matching one or more characters of the text string using a state machine, wherein the state machine comprises a ternary content addressable memory (TCAM) and wherein the performing comprises comparing a state of the state machine and one of the plurality of characters with contents of a state field and a character field, respectively, stored in the TCAM, wherein the contents of the state field and the

character field stored in the TCAM embody state transitions of the state machine, wherein the performing further comprises:

converging all branches of the state machine, for a given stored pattern, to a single next state when a first number of the characters are matched to the contents of a state field of all state transitions of the branches, wherein the single next state is an earlier possible next state for at least one of the branches and wherein the converging comprises transitioning at least one of the branches to the earlier possible next state.

45. (Currently Amended) A string search apparatus, comprising:
control circuitry to receive a text string having a plurality of characters; and
a pattern and state database including a ternary content addressable memory (TCAM) coupled to an associated memory, wherein the pattern and state database is operable to perform an unanchored search of the plurality of characters with patterns stored in the TCAM and associated memory by comparing a state of the state machine and one of the plurality of characters with contents of a state field and a character field, respectively, within the patterns stored in the TCAM, wherein the contents of the state field and the character field stored in the TCAM embody state transitions of the state machine, and wherein for a given stored pattern all branches of the state machine are converged to a single next state when a first number of the characters are matched to the contents of a state field of all state transitions of the branches, wherein the single next state is an earlier possible next state for at least one of the branches, wherein the control circuitry comprises:

- a first-in-first-out (FIFO) storage element for storing the plurality of characters;
- a register coupled to the FIFO storage element and the TCAM;
- a rollback circuit coupled to the FIFO storage element; and
- a current prefix register.

Allowable Subject Matter

5. Claims 20, 22, 45-46 and 49-52 are now renumbered as 1-8 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 20, the prior art fails to disclose or make obvious a method comprising, in addition to the other recited features of the claim, the step of converging all branches of the state machine, for a given stored pattern, to a single text state when a first number of the characters are matched to the contents of a state field of all state transitions of the branches, wherein the single next state is an earlier possible next state for at least one of the branches and wherein the converging comprises transitioning at least one of the branches to the earlier possible next state in the manner recited in claim 20.

Regarding claim 45, the prior art fails to disclose or make obvious a string search apparatus comprising, in addition to the other recited features of the claim, the details and function of a pattern and state database including a ternary content addressable memory coupled to an associated memory in the manner recited in claim 45.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONICA M. PYO whose telephone number is (571)272-8192. The examiner can normally be reached on Mon- Fri 8:00 - 2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Apu Mofiz can be reached on 571-272-4080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Monica M Pyo
Examiner
Art Unit 2161

10/2009

/Apu M Mofiz/

Supervisory Patent Examiner, Art Unit 2161